

P.S. 28th.—The most violent earthquake felt occurred on the night of the 20th, just before midnight. As usual, there were two shocks; noise with the first or preceding it, and the second most sensible; the former continuing four and the latter twelve seconds. Standing erect, the direction from which the noise and wave came was undoubtedly near W.S.W., and this position was assumed at the earliest symptom, that these facts might be more easily appreciated. Our seismometer gave no tidings.

*Lieut.-Colonel Edward Sabine, R.A.,
F.R.S. &c. &c., Woolwich.*

The Society then adjourned over the vacation to Thursday the 21st of November 1850.

November 21, 1850.

Dr. ROGET, V.P., in the Chair.

Dr. Graves was admitted into the Society.

The following gentlemen were elected Foreign Members:—

H. W. Dove.		J. E. Purkinje.
Joseph Liouville.		W. Weber.

November 28, 1851.

The EARL OF ROSSE, President, in the Chair.

William Fairbairn, Esq., Captain Ibbetson, and J. F. Miller, Esq., were admitted into the Society.

Dr. Faraday then delivered the Bakerian Lecture, which in substance was a résumé of the following papers:—

1. "Experimental Researches in Electricity." Twenty-fourth Series. On the possible relation of Gravity to Electricity. By Michael Faraday, Esq., D.C.L., F.R.S. &c.

Under the full persuasion that all the forces of nature are mutually dependent, and often, if not always, convertible more or less into each other, the author endeavoured to connect gravity and magnetic or electric action together by experimental results, and though the conclusions were, when cleared from all error, of a negative nature, he still thinks that the principle followed and the experiments themselves deserve to be recorded. Considering that some condition of the results produced by gravity ought to present itself, having a relation to the dual or antithetical character of the magnetic or electric forces, it seemed to the author that the approxi-

mation of two gravitating bodies towards each other, and their separation, were the only points which offered this kind of coincidence; and therefore, using the earth as one gravitating body, he employed a cylinder of metal, glass, resins, or other substances, as the other, and endeavoured to ascertain when the latter was allowed to fall, being surrounded by a helix of wire, whether any electric current was generated. Sometimes the cylinder was allowed to fall through the helix; at other times with the helix; and occasionally the helix was made the falling body. But when the various sources of error which sprung up were gradually removed, no traces of electric action remained which could be referred to the power of gravity.

In order to obtain a greater effect, an apparatus was employed (being nearly that used in the 23rd Series of these Researches) by which the effect of raising a body from the earth could be combined with that of a falling body by the fit use of commutators (if any action at all were produced). The apparatus was very good, and gave exceedingly delicate results, as was shown by other consequences of its action; but in respect of gravity it produced no effect whatever. Notwithstanding his failure in obtaining any experimental relation between gravity and magnetic or electric force, the author still expresses his conviction that there is a relation, and his hopes that it may be hereafter practically demonstrated.

2. "Experimental Researches in Electricity." Twenty-fifth Series. On the Magnetic and Diamagnetic Condition of Bodies. By Michael Faraday, Esq., D.C.L., F.R.S., &c. Received September 9, 1850.

As the author could find no polarity in diamagnetic bodies when under magnetic influence (a result described in the 23rd Series of these Researches), he endeavoured to discover some other physical condition of them, and of magnetic bodies, by which he might obtain an insight into their respective natures, and establish the true place of the magnetic zero; and considering the power with which a magnetic body moves, or tends to move, from weaker to stronger places of action, and that of a diamagnetic body to pass from stronger to weaker places of action, he hoped to obtain some results of condensation with the first class, and of expansion with the second, when they were subjected to very strong magnetic action; the respective bodies being selected from the class of gaseous substances, in which change of volume can be easily produced and measured. In the first place, therefore, a ray of light was passed over the surface of powerful magnetic poles surrounded by different gases, and the place of its source carefully examined by telescopes, micrometers, and other means, to ascertain whether the layer of air in contact with the poles was affected in its refracting force; but though the experiment was made in oxygen, nitrogen, and other gases, not the slightest effect was visible.

Resigning this process, therefore, two air-tight chambers were made, in which the magnetic poles formed the chief part of the internal surface of the chamber. The one was formed by bringing the flat ends of the two poles to within $\frac{1}{80}$ th of an inch of each other, with a frame all round to form the sides; and the other by